




RF/RMRS-98-288

**Closure Description Document
for
RCRA Units 21 and 48**

U. S. Department of Energy

Rocky Flats Environmental Technology Site

January, 1999


Reviewed for Classification
1/15/99
Date

ADMIN RECORD

IA -A-00143

**CLOSURE DESCRIPTION DOCUMENT
FOR RCRA UNITS 21 AND 48**

REVISION 0

January, 1999

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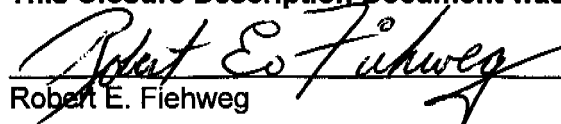
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1.0 INTRODUCTION

This Closure Description Document (CDD) describes the activities that will be completed in order to achieve complete closure of Resource Conservation and Recovery Act (RCRA) units in accordance with the closure plans contained in Part X of the Rocky Flats Environmental Technology Site (RFETS) RCRA Part B Permit (Permit Number CO-97-05-30-01) and the *Closure Plan for Interim Status Units at the RFETS - August, 1997* (together "the Closure Plans"). Unit 21 is a permitted storage unit located in Building 788. Unit 48 is an interim status unit comprising the pondcrete solidification process equipment located in the area of Building 788, which includes the clarifier tank system. Both units are associated with the former Operable Unit 4, the Solar Evaporation Ponds, currently identified as a corrective action area within the Industrial Area. The closure activities described in this document are not part of any future corrective actions which will address contamination in the solar ponds area.

In 1997, the Department of Energy (DOE), Kaiser-Hill Company L.L.C. (K-H), and the Colorado Department of Public Health and Environment (CDPHE) entered into an Order on Consent (97-08-21-01) which required, *inter alia*, that DOE and K-H implement the 1997 Tank Management Plan (the Plan). Pursuant to the Plan, the clarifier tank system must be clean closed and removed by June 30, 1999. The closure described herein will allow the Site to meet this commitment. The scope of the closure project includes the segregation, management and disposal of waste and debris, removal of the building to the concrete slabs and minor curbs and pads, and certification of the closure.

The Closure Plans allow for closure decontamination by three methodologies. Closure will be accomplished by one or more of the following methods: (1.) removing all waste (Waste Inventory Removal); (2.) decontaminating equipment and structures by an approved method to achieve closure performance standards; or (3.) cleaning material to meet "debris rule" standards. A fourth method, allowed by regulation, is the recycling of metal as scrap metal. These options are described in Section 5.0.

Although the activities described in this document include the demolition of a building, which essentially results in a facility decommissioning governed by the Rocky Flats Cleanup Agreement (RFCA), RFCA paragraphs 96 and 97 provide that remedial work can be conducted as a RCRA closure rather than a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) accelerated action where appropriate. In this case it is appropriate because these facilities comprise RCRA units.

1.1 SCOPE OF CLOSURE PROJECT

The Building 788 Cluster Closure project includes Building 788 (B788), trailer T788A, the clarifier tank, Building 308A, and miscellaneous structures, equipment and debris in the immediate vicinity (see Table 7-1 for detailed description of closure activities). All of the equipment and materials were associated with either the production and processing of pondcrete in Unit 48 or the storage of pondcrete in Unit 21. In general, the project will begin with property and waste management and removal, followed by building demolition, and final closure by decontaminating the remaining concrete slabs. Wastes removed from the units will be managed and disposed of as described in the project's Waste Management Plan (see Section 1.3 below).

Closure of RCRA Unit 48 entails removal of the clarifier tank, including the surrounding woodshed and ancillary equipment, such as piping, pumps, and an air compressor. Only the concrete slab and minor curbs and pads will remain in place. Associated equipment and structures including the pug mill, steel rack, sludge transfer equipment (e.g. pumps), and timber will be removed. Ancillary equipment on the northwest side of B788 will also be removed.

Building 788 will be dismantled down to the slab. All utilities services will be disconnected and isolated, and abandoned or interfering utility poles will be removed. The T788A support trailer will be relocated to another location within the Protected Area for use on other projects. Protruding concrete stem walls and foundations on both the north and south side of B788 will be removed to the extent practical. Project activities will not disturb any soil around the building, except in an incidental manner such as impressions from heavy materials or equipment resting on and compressing the soil. Property meeting the radiological free release criteria and with no hazardous contamination will be transferred to Property Utilization and Disposal (PU&D). Radioactively contaminated metals will be recycled wherever possible; non-recyclable material will be managed and disposed of as waste. Waste containers, if any, will be removed from the building, the remaining slab will be washed and RCRA Unit 21 will be closed.

1.2 HAZARDS AND DEMOLITION

Closure activities present several types of hazards to workers and the environment. Precautions are taken at every stage of the project to prevent harm to human health or the environment, and prior to any work, project personnel ensure that proper safety controls are in place and that all prerequisites are complete. Three key elements of hazard elimination are the health and safety requirements, the Site Hazard Assessment process and the planning of demolition.

A Health and Safety Plan (HSP) is required for all project work conducted at RFETS. The HSP follows OSHA guidelines in the identification of proper health and safety practices for the protection of workers. As described in the Closure Plans, actual numbers of personnel required for the closure will be determined at the time of closure based on the closure schedule, safety, and regulatory standards. Personnel involved in the closure will be qualified in accordance with Part IX of the permit, and will be trained in necessary mechanical skills for conducting closure, decontamination techniques, and safety procedures necessary to accomplish closure.

The hazard assessment process involves the development of a Site Hazard Assessment Plan, in which all potential hazards are identified and plans for assessment are described. Assessment activities include sampling the physical structure for such materials as asbestos, hazardous constituents, radioactivity, and polychlorinated biphenyls (PCBs). Results of chemical analysis, field surveys, process knowledge, and other pertinent sources of information are compiled in a Site Hazard Assessment Report, which is used to guide workers in their day-to-day activities. This report also contains the information required by the Contaminant Evaluation provisions of the Closure Plans.

The B788 closure activities involve the demolition of a facility, and will require a demolition permit from the Air Pollution Control Division of the Colorado Department of Public Health and Environment (CDPHE), based on a Project Demolition Plan, prepared and submitted by a qualified and experienced Demolition Subcontractor. The Project Demolition Plan will describe the demolition methodology to be used; selection is based on a number of factors, including the results of the hazard assessment process. All work activities will be performed in accordance with industry standards using common types of mechanical methods and equipment. The demolition subcontractor will minimize environmental impacts using procedures that prevent uncontrolled releases of waste, control storm water run-on and run-off, and minimize fugitive dust. Work activities are coordinated with site environmental organizations to ensure that requisite monitoring is conducted (e.g. event-based surface water monitoring in the B788 sub-basin), and that work activities do not have an ecological impact, such as disturbing migratory birds or potential habitat for the Preble's Meadow Jumping Mouse.

1.3 WASTE MANAGEMENT

A Waste Management Plan (WMP) will be developed for this closure project. The WMP will identify the roles and responsibilities of all individuals involved in waste generation, waste handling and disposal in accordance with the Site's RCRA Part B permit and RFETS procedures. The WMP will assure that the Waste Inventory Removal requirements of the Closure Plans are met. The anticipated types of waste,

approximate volumes, and potential disposal options are described in Section 7.0 of this document. Also, in accordance with the Closure Plans (X.B.6.f), waste minimization will be practiced wherever possible. For example, as much material as possible will be recycled as scrap metal, and as little material as possible will be disposed of as low-level mixed waste. Although it is not expected for this project, it is possible that some waste may be encountered for which there are no off-site disposal options. That mixed waste which cannot be disposed of off-site will be managed under the Site Treatment Plan (STP).

2.0 UNIT CLOSURE NOTIFICATION, SCHEDULE, AND CERTIFICATION

The removal of Building 788, the clarifier tank and ancillary equipment (including the 308A pumphouse) will constitute closure of Units 21 and 48. Notification has been submitted to the Director of the CDPHE of the intent to close the process waste system. In accordance with the Closure Plans, all closure activities will be completed within 180 days of the commencement of closure. If additional time is required, the Director will be notified of the additional amount of time required and the reason for the delay. It is anticipated that closure activities will commence early in 1999, and be completed by the June 30, 1999 commitment, well within the 180 day allowance.

3.0 UNIT DESCRIPTIONS

Both Unit 21 and Unit 48 are located in the vicinity of the Solar Evaporation Ponds in the northeast corner of the Protected Area (PA) of RFETS. Pondcrete was treated in Unit 48 and stored in Unit 21.

3.1 RCRA Unit 21

Unit 21 is the pondcrete storage area, Building 788, with a permitted capacity of 44,000 gallons or 200 cubic yards. The building is of metal construction on a concrete slab, 225 feet in length and 20 – 25 feet wide. The boundaries of the unit are all above ground materials and structures within or nearby the footprint of the building.

3.2 RCRA Unit 48

The pondcrete solidification process, process code T04, was conducted in Unit 48. The boundary of the unit is the following equipment: the clarifier tank, pug mill, cement mixer, building 308A, and associated ancillary equipment such as pumps, valves, hoses, and piping.

4.0 CONTAMINANT CHARACTERIZATION

The Closure Plans require that the CDD describe the types of contamination to be addressed, and the methods and media of decontamination. A unit will be considered decontaminated if all visible waste residuals are removed and final rinsates meet the closure performance standard for "priority pollutants (identified as having been managed in the unit) and heavy metals" (X.C.6). The list of priority pollutants and metals is derived from the EPA Waste Codes associated with the units, as described below. Sampling and analysis will be conducted by methods compatible with the contaminants of concern, and analytical procedures will be conducted in accordance with approved laboratory procedures which meet the requirements of SW-846, as required by the Closure Plans.

4.1 EPA WASTE CODES ASSOCIATED WITH RCRA UNITS 21 AND 48 AND CONTAMINANTS OF CONCERN

The following EPA Waste Codes were identified in the RCRA Part A application (February 1997) for Units 21 and 48:

D002, D003, D006, D007, D008, D009, D018, D019, D028, D029, D035, D038, D040, D043, F001, F002, F003, F005, F006, F007, F009

The RCRA Part B permit expanded the list of codes to include:

D001, D004, D005, D010, D011 and F008

The following table, Table 4-1, identifies all of the contaminants of concern associated with each of the waste codes listed above. Process knowledge and previous analyses of the materials handled and stored in units 21 and 48 show that some of the contaminants of concern were not found in the waste managed in these units (e.g. pyridine, 2-ethoxyethanol, 2-nitropropane or wastes with the characteristic of ignitability). Therefore, in accordance with the Closure Plans, only those priority pollutants listed in Table 4-1 that are identified as having been managed in these units will be analyzed for in the decontamination process. The record for this closure will include either analysis for each parameter or justification for exclusion.

Table 4-1 Associated EPA Waste Codes And Contaminants Of Concern

EPA Waste Code	Associated Contaminants of Concern
D001	Ignitable
D002	Corrosive
D003	Reactive
D004	Arsenic
D005	Barium
D006	Cadmium
D007	Chromium
D008	Lead
D009	Mercury
D010	Selenium
D011	Silver
D018	Benzene
D019	Carbon Tetrachloride
D028	1,2 Dichloroethane
D029	1,1 Dichloroethylene
D035	Methyl ethyl Ketone
D038	Pyridine
D040	Trichloroethylene
D043	Vinyl Chloride
F001, F002, F003, F005	1,1,1 Trichloroethane
	1,1,2 trichloro-1,2,2 trifluoroethane
	1,1,2 trichloroethane
	Acetone
	Benzene
	Carbon disulfide
	Carbon tetrachloride
	Chlorobenzene
	Cyclohexanone
	Ethyl acetate
	Ethyl benzene
	Ethyl ether
	2-ethoxy ethanol
	Isobutanol
	Methanol
	Methyl ethyl ketone

EPA Waste Code	Associated Contaminants of Concern
F001, F002, F003, F005	Methyl isobutyl ketone
	Methylene chloride
	n-butyl alcohol
	2-nitropropane
	o-dichlorobenzene
	Pyridine
	Tetrachloroethylene
	Toluene
	Trichloroethylene
	Trichlorofluoromethane
F006, F007, F008, F009	Xylene
	Cadmium
	Chromium
	Cyanide, Total
	Cyanide, amenable
	Lead
	Nickel
	Silver

5.0 DECONTAMINATION METHODOLOGIES

In order to achieve complete closure, Units 21 and 48 will be removed completely to the concrete slab, thereby eliminating further maintenance and potential releases of hazardous waste to the environment. The Closure Plans allow for closure decontamination by three methodologies: (1.) decontaminating equipment and structures by an approved method to achieve closure performance standards; (2.) cleaning material to meet "debris rule" standards; or (3.) removing all waste (Waste Inventory Removal). A fourth method, allowed by regulation, is the recycling of metal as scrap metal. These options are described below.

5.1 OPTION 1: DECONTAMINATION OF MATERIAL TO MEET CLOSURE PERFORMANCE STANDARD

If this option is selected for all or part of the materials from these units, closure will consist of removing visible residuals, decontaminating tanks, pipes and ancillary equipment with a solution capable of removing the contaminants of concern and testing the final rinsate to verify the closure performance standard is met. This decontamination will be conducted in accordance with the Closure Plans.

5.1.1 Closure Activities For Decontamination of Material Associated with RCRA Units 21 and 48

Closure activities for decontamination identified in this section include the following:

1. Water containing sodium carbonate and trisodium phosphate will be used as the decontamination solution.
2. Surfaces that may have reasonably been in contact with hazardous wastes, including interior surfaces of tanks, piping, ancillary equipment and secondary containment structures (e.g., the container storage pad in Unit 21), will be washed with the decontamination solution. A final rinse will be conducted on all washed surfaces, and a representative sample of the final rinsate solution will be collected and analyzed.
3. The final rinsate closure performance standards for internal surfaces of tanks, piping and ancillary equipment set forth in the Closure Plans will be used to evaluate the effectiveness of the decontamination;
4. The final rinsate volume will not exceed 5% of the capacity of the system and the pH of the rinsate shall be between 6 and 9.
5. Items that have been decontaminated and wash/rinse solutions that meet the

closure performance standards may be managed as low-level waste (i.e., not subject to RCRA Subtitle C regulation).

5.1.2 Material Disposition

Material successfully decontaminated under this option will be either managed as LLW or as scrap metal as defined at 6 CCR 1007-3, Part 261.6 (a)(3)(iii).

5.2 OPTION 2: WASTE INVENTORY REMOVAL AND WASTE MANAGEMENT

If this option is selected, waste inventory removed from the unit will be managed as RCRA mixed waste. The material will be removed, size reduced, where feasible, and placed into permitted storage on-site until it is shipped to an off-site treatment, storage or disposal facility. Hazardous waste and/or mixed wastes generated from this project will be managed in accordance with applicable state and federal regulations. Waste management activities are described in the Waste Management Plan.

5.3 OPTION 3: "DEBRIS RULE" DECONTAMINATION

If this option is selected for material from RCRA Units 21 and 48, the material will be managed as RCRA hazardous debris in accordance with 6 CCR 1007-3, Part 268.45 and the Closure Plans. This option is applicable to material for which there is no further use or reuse, and which is intended to be discarded.

5.3.1 "Debris Rule" Decontamination Closure Activities

Hazardous debris will be considered decontaminated if the following are met:

1. The material is debris as defined at 6 CCR 1007-3, Part 268.45.
2. A technology as specified in 6 CCR 1007-3, Part 268.45, Table 1 is selected. Extraction or destruction technologies will be selected over immobilization technologies whenever possible. Hazardous debris in Building 788 will be decontaminated using water washing and spraying. Water containing sodium carbonate and trisodium phosphate will be used as the decontamination solution.
3. A volume of rinse water to ensure adequate residence time is used.
4. The debris surface is clean as defined by 6 CCR 1007-3, Part 268.45.

All treatment residuals including rinsates generated from extraction and/or destruction technologies used in closing Building 788 will be characterized and managed accordingly. If the debris closure performance standards are not met, the material will be removed and managed as RCRA mixed waste.

5.4 OPTION 4: SCRAP METAL FROM RCRA UNITS 21 AND 48

The metal from the building will be managed as LLW and is exempted from RCRA as scrap metal. Other qualifying material will also be recycled as RCRA scrap metal.

6.0 CLOSURE ACTIVITIES

Closure activities fall into three categories: (1.) waste inventory removal and closure of unit components; (2.) final closure of the remaining concrete slabs; and (3.) soil contamination evaluation. Closure activities will be implemented to minimize waste and to ensure the protection of human health and the environment. Specific closure activities are summarized in Table 7-1 along with estimates of the volumes of waste anticipated from each activity.

6.1 CLOSURE OF UNIT COMPONENTS

Units 21 and 48 will be closed by removing materials associated with the permitted units, decontaminating as described above, or managing as waste or recyclable scrap metal. These activities will have a duration of approximately 3 to 4 months, or about one half to three quarters of the 180 day closure period. Upon completion of closure activities, the only remains will be the concrete slabs from buildings 788 and 308A, which will be closed as described below. As described in the Closure Plans, the contaminant evaluation will be used to identify the need, degree and process for decontamination. The decontamination step may be eliminated where it is possible to document that there have been no releases or no contact with hazardous wastes.

6.2 CLOSURE OF CONCRETE SLABS

Following the closure of unit components, the remaining concrete slabs will be closed by scrubbing with a machine capable of carrying cleaning solutions and providing brushing action on the floor surfaces. After scrubbing, the solution may be tested for contaminants, or an additional rinsing step (or steps) will be added, and the rinsate will be tested. If the contaminant levels are equal to or less than Tier II Groundwater Action Levels, the slab shall be considered closed. For further confirmation, samples of the

remaining concrete may be taken for comparison to Tier I Soil Action Levels. If a Contaminant of Concern (from Table 4-1) is found to be present for which there is no Tier II Groundwater Action Level, a standard will be proposed for approval by CDPHE. In addition to the evaluation for contaminants of concern, the slabs will also be subjected to final radiological surveys.

This activity will have a duration of approximately one month, depending on the levels of contaminants collected in the scrubbing process.

If the performance standard cannot be met, the unit will be deferred to environmental restoration after notifying CDPHE and employing any measures necessary for preventing the release of waste constituents to the environment.

6.3 SOIL CONTAMINATION

Soil contamination will be evaluated as required by the Closure Plans. Any soil contamination discovered during or after the closure of these units will be deferred to environmental restoration for remediation and inclusion in an appropriate decision document. CDPHE will be notified of any soil contamination found during closure activities.

7.0 DISPOSITION OF WASTE

Closure activities may generate a combination of radioactive, hazardous, and mixed wastes. Contaminated metals, clarifier, pipeline, sumps and ancillary equipment are expected to be the major sources of waste. Plastic, tools, personal protective equipment (PPE) and other materials associated with closure will also be a source of waste. Unless more than incidental amounts of hazardous waste comes into direct contact with the surface of the PPE, PPE will be managed as LLW. Waste will be handled by qualified waste management personnel, who will work with decontamination specialists and radiation control technicians to identify and segregate the hazardous/LLM or LLW. Waste packaging technicians will package and label the waste, and will arrange for radioactive waste to be certified. Liquid hazardous or radioactive waste generated after the process waste lines are no longer in service will be collected in drums and shipped to Building 374 for processing. Solid waste in drums or boxes will be managed appropriately.

7.1 ESTIMATE OF WASTE VOLUMES TO BE GENERATED

Table 7-1 describes the removal activities in each of the major areas of Units 21 and 48, the nature and approximate volume of waste that will be generated, and the

anticipated categorization of the waste types.

In general, solid and hazardous waste disposition will be by one of the following methods, depending on waste type:

Reusable items will go to PU&D after contamination surveys are conducted.

Free Release Disposal, also called Sanitary Waste or Solid Waste – solid wastes will be sent to an off-site disposal facility (e.g. USA Waste) after contamination surveys.

Free Release Recycle – metal waste found to be free of radioactive contamination will be sent off-site for recycling.

Low level or mixed recycle – low level radioactive or low level mixed metal waste will be sent to an approved facility for remelting and recycling.

Low Level Disposal – low level waste that cannot be recycled will be packaged and shipped to an approved off-site disposal (e.g. Nevada Test Site).

Low Level Mixed Disposal – mixed waste that cannot be recycled or treated to remove hazardous constituents will be packaged and shipped to an approved off-site facility (e.g. Envirocare).

Liquids – washing solutions and rinsates transferred to B374 for treatment.

Table 7 -1 Summary of Waste Sources And Estimated Waste Volumes

Closure Activities and Waste Sources	Estimated Waste Volume	Waste Type (a)
B788 interior surfaces will be decontaminated as necessary, the building will be dismantled, and the concrete slab will remain in place.	Building Metal 100 m ³ . Wash water - 2-5,000 gallons	RM, S Liquid
Clarifier Tank, and woodshed will be dismantled.	Clarifier metal 50 m ³ Wood 8.0 m ³	RM LLW
The process piping inside B788, around the B788 Complex, and between the Clarifier Tank and Building 788 will be removed.	Process piping 2.0 m ³	RM, LLW
All electrical services to B788, T788A, Clarifier, pug mill and other equipment will be disconnected. Wiring will be de-terminated at the power source. All wire will be left inside conduits as found. Conduits will be removed to a practical location with the remaining	Conduits and wiring 2.0 m ³	RM, LLW

Closure Activities and Waste Sources	Estimated Waste Volume	Waste Type (a)
conduits abandoned in place and labeled.		
The two power poles at the southwest corner of B788 may have to be removed; if removed power poles will be cut off at grade.	Power poles 4.0 m ³	LLW
The equipment and structures on the southeast side of B788 will be demolished and removed. This includes the pug mill, steel rack, temporary equipment for sludge transfer, forklift, and the concrete/timber ramp. The flexible hose running from the clarifier to the loading station will be removed.	Equipment 25 m ³ Concrete 2.0 m ³ Wood 6.0 m ³ Flexible hose 4.0 m ³	RM, LLM
The protruding concrete stem walls and foundations on the north side of B788 and concrete foundations around B788 (south side) will be removed to the extent practical to facilitate filling and grading the area with soil.	Concrete 4.0 m ³	LLW
The jersey barriers on the south access road to Building 788 will be relocated to PU&D, and the bollards will be removed at grade.		Reuse

(a) LLW = Low Level Waste LLM = Low Level Mixed Waste RM = Recyclable Metal
Reuse = Disposition to PU&D S = Sanitary or solid waste

7.2 WASTE DISPOSITION

As required by the Closure Plans, all wastes will be removed and transferred to another permitted unit or shipped off-site for storage, treatment or disposal. Waste management, handling, transportation and disposal will follow the requirements of the RCRA Part B permit, RFETS procedures, and other requirements. Waste disposition will match the type of waste (LLW, LLM, etc.) with the qualifications of the off-site facility.

8.0 RECORD KEEPING

The following closure documentation will be maintained as part of the Operating Record:

- this Closure Description Document;
- a field logbook indicating the date, number, and type of sampling activities;
- analytical results;
- records of actions taken to decontaminate equipment or structures;
- work control packages developed governing closure activities; and
- documentation that closure was conducted in accordance with the closure plan.